1 (currently amended). A method for generating an elliptic grid of coordinates in two dimensions or in three dimensions, the method comprising:

providing defining equations, valid near at least one boundary segment in a generalized coordinate system, of a selected grid system, where each of the defining equations has at least two independent Cartesian coordinate variables, has at least one generalized coordinate as a dependent variable, and comprises a partial differential equation, expressed in at least one generalized coordinate;

providing a selected group of boundary constraints for the grid system, valid near the at least one boundary segment, where a decay parameter for at least one of the generalized coordinate dependent variables near the at least one boundary segment is determined as part of a solution for the grid system, rather than being prescribed initially;

providing defining equations and selected boundary conditions, having at least two independent coordinate variables and at least one dependent variable, for steady state heat transfer on a long thin fin, and providing a correspondence between the at least two independent coordinate variables for the grid system near the at least one grid boundary segment with the at least two independent coordinate variables for the heat transfer problem;

providing a correspondence between a selected power of at least one heat transfer coefficient for the heat transfer problem and at least one decay parameter for the grid system near the at least one grid boundary segment; ~~and~~

determining a solution of the grid system near the at least one grid boundary segment that incorporates at least one boundary constraint comprising the at least one decay parameter determined for the grid system [[.]] ; and

displaying, in a visually perceptible format, the solution of the grid system near the at least one grid boundary segment that incorporates the at least one boundary constraint.

2 (original). The method of claim 1, further comprising selecting said grid system decay parameter to be directly proportional to said heat transfer coefficient.

3 (original). The method of claim 1, further comprising permitting said at least one decay parameter to vary with at least one of said at least two generalized coordinates.

4 (original). The method of claim 1, further comprising:

allowing an environment for said defining equations for said grid system to vary from a first time to a second time; and

applying said method and said defining equations at the first time and at the second time to determine said solution of said grid system at each of the first and second times.

5 (currently amended). A system for generating an elliptic grid of coordinates in two dimensions or in three dimensions, the system comprising a computer that is programmed:

to provide defining equations, valid near at least one boundary segment in a generalized coordinate system, of a selected grid system, where each of the defining equations has at least two independent Cartesian coordinate variables, has at least one generalized coordinate as a dependent variable, and comprises a partial differential equation, expressed in at least one generalized coordinate;

to provide a selected group of boundary constraints for the grid system, valid near the at least one boundary segment, where a decay parameter for at least one of the generalized coordinate dependent variables near the at least one boundary

segment is determined as part of a solution for the grid system, rather than being prescribed initially;

to provide defining equations and selected boundary conditions, having at least two independent coordinate variables and at least one dependent variable, for steady state heat transfer on a long thin fin, and to provide a correspondence between the at least two independent coordinate variables for the grid system near the at least one grid boundary segment with the at least two independent coordinate variables for the heat transfer problem;

to provide a correspondence between a selected power of at least one heat transfer coefficient for the heat transfer problem and at least one decay parameter for the grid system near the at least one grid boundary segment; ~~and~~

to determine a solution of the grid system near the at least one grid boundary segment that incorporates at least one boundary constraint comprising the at least one decay parameter determined for the grid system [[.]] ; and

to display, in a visually perceptible format, the solution of the grid system near the at least one grid boundary segment that incorporates the at least one boundary constraint.

6 (original). The system of claim 5, wherein said grid system decay parameter is directly proportional to said heat transfer coefficient.

7 (original). The system of claim 5, wherein said at least one decay parameter varies with at least one of said at least two generalized coordinates.

8 (original). The system of claim 5, wherein said computer is further programmed:

to allow an environment for said defining equations for said grid system to vary from a first time to a second time; and

to apply said method and said defining equations at the first time and at the second time to determine said solution of said grid system at each of the first and second times.